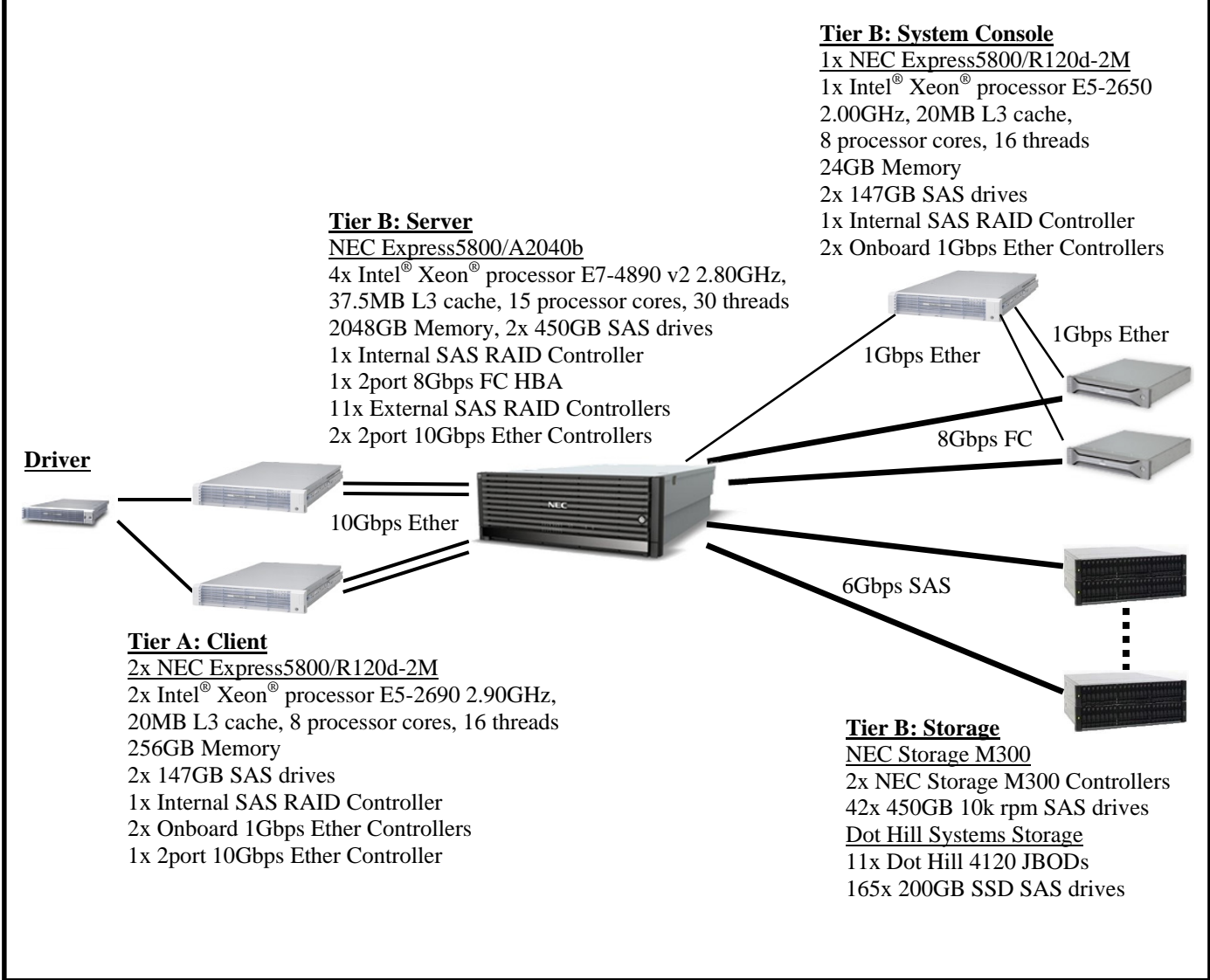


| | | | |
|--|---|---|---|
| NEC | NEC Express5800/A2040b | | TPC-E 1.12.0 TPC Pricing 1.7.0 |
| | | | Report Date 18-Feb-2014 |
| TPC-E Throughput 5,087.17 tpsE | Price/Performance \$229.04 USD per tpsE | Availability Date 15-Apr-2014 | Total System Cost \$1,165,158USD |

Database Server Configuration

| | | | |
|---|---|---|-------------------------|
| Operating System Microsoft® Windows Server® 2012 Standard Edition | Database Manager Microsoft® SQL Server® 2014 Enterprise Edition | Processors/Cores/Threads 4 / 60 / 120 | Memory 2048GB |
|---|---|---|-------------------------|



| | | |
|---|--|--|
| Initial Database Size 22,572 GB | Redundancy Level : 1 RAID10 : Log / RAID5 : Data | Storage 42 x 450GB 10K HDD 165 x 200GB SSD |
|---|--|--|



NEC Express5800/A2040b

TPC-E 1.12.0
TPC Pricing 1.7.0

Report Date
18-Feb-2014

Available Date
15-Apr-2014

| Description | Part Number | Brand | Price Source | Unit Price | Qty | Extended Price | 3 yr. Maint. Price |
|--|--------------------|-----------|--------------|------------|-----|-----------------|--------------------|
| Server Hardware | | | | | | | |
| NEC Express5800/A2040b | | | | | | | |
| Express5800/A2040b (with MGMx2, Fan (full), Rack Mount Kit, SUV Cable, Cover for PCI Hot-plug) | NE3400-040F | NEC | 1* | 14,990 | 1 | 14,990 | |
| Xeon E7-4890 v2 Processor Kit | NE3301-H001F | NEC | 1* | 18,500 | 4 | 74,000 | |
| Memory Riser Card (A2040b/A2020b/A2010b) | NE3402-H001 | NEC | 1* | 530 | 8 | 4,240 | |
| 64GB Memory (2 x 32GB DIMM) | NE3302-H012F | NEC | 1* | 3,350 | 32 | 107,200 | |
| RAID Controller (1GB, RAID 0/1/5/6) | NE3303-168 | NEC | 1* | 930 | 1 | 930 | |
| 450GB HDD(10Krpm, SAS) | NE3350-322 | NEC | 1* | 390 | 2 | 780 | |
| Fibre Channel Controller (2 port) | NE3390-154 | NEC | 1* | 1,620 | 1 | 1,620 | |
| External RAID Controller (1GB, RAID 0/1/5/6) | NE3303-H001 | NEC | 1* | 1,180 | 11 | 12,980 | |
| 10GBASE Adapter (SFP+/2ch) | NE3304-128 | NEC | 1* | 740 | 2 | 1,480 | |
| SFP+ Module (10G-SR) | NE3304-129 | NEC | 1* | 150 | 4 | 600 | |
| Internal DVD Super Multi Drive | NE3351-107 | NEC | 1* | 120 | 1 | 120 | |
| Power Supply Unit (1000W) | NE3381-88 | NEC | 1* | 620 | 4 | 2,480 | |
| CBL,AC PWR,2.5M C14 TO C13 | Q24-RH000000007079 | NEC | 1 | 4 | 4 | 16 | |
| Front Bezel (A2040b/A2020b/A2010b) | NE3346-H001 | NEC | 1* | 100 | 1 | 100 | |
| Cable Arm (70mm) | NE3343-H001 | NEC | 1* | 290 | 1 | 290 | |
| Installation | INST-CXA20-202040 | NEC | 1* | 5,000 | 1 | 5,000 | |
| Windows Server Standard 2012 x64 English 2CPU/2VM | Q24-HL000000059843 | NEC | 1 | 882 | 1 | 882 | |
| Windows Server Standard 2012 64-bit English 2CPU/2VM Additional License | Q24-HL000000059844 | NEC | 1 | 882 | 1 | 882 | |
| Platinum Warranty (Yr 1,2 & 3) | Q24-DN000000068496 | NEC | 1* | 7,250 | 1 | | 7,250 |
| Express5800/R120d-2M (as system maintenance console) | | | | | | | |
| Express5800/R120d-2M, No CPU, no RAM, no ODD, no HDD, no PSU, no bezel | N8100-1793F | NEC | 1 | 1,920 | 1 | 1,920 | |
| Xeon E5-2650 Processor Kit, E5-2650, 2GHz, 8C/16T, 95W | N8101-549F | NEC | 1 | 1,880 | 1 | 1,880 | |
| 8GB DDR3-1600 REG Memory Kit, 2x 4GB, DDR3L-1600, Registered | N8102-469F | NEC | 1 | 175 | 3 | 525 | |
| RAID Controller (512MB, RAID 0/1) | N8103-149 | NEC | 1 | 350 | 1 | 350 | |
| 146.5GB HDD, SAS2.0(6Gbps), 15,000rpm, 2.5-inch, HotPlug, new tray | N8150-303 | NEC | 1 | 270 | 2 | 540 | |
| External DVD-ROM (USB) | N8160-85 | NEC | 1 | 215 | 1 | 215 | |
| 800W Hot Plug Power Supply, 80 PLUS Platinum | N8181-87F | NEC | 1 | 265 | 1 | 265 | |
| 6 ft Universal Power cord - IEC320 C13 to NEMA 5-15P | 307-00012-000 | NEC | 1 | 4 | 1 | 4 | |
| 3 Year Upgrade to Platinum Warranty for R120d-2M GP Server | Q24-DN000000012023 | NEC | 1 | 1,799 | 1 | | 1,799 |
| AccuSync AS171-BK 17" LCD Display (+2 spares) | AS171-BK | NEC | 3 | 137 | 3 | 411 | |
| | | | | | | Subtotal | 234,700 |
| | | | | | | | 9,049 |
| Disk Subsystem | | | | | | | |
| NEC Storage M300 | | | | | | | |
| M300 2.5 Inch Disk Array Unit including M300 Storage BaseProduct software (w/o Controller Cards) | NF5331-SB01E | NEC | 1 | 12,293 | 2 | 24,586 | |
| 3 Years Upgraded Platinum Warranty for M300 Disk Array Unit (2.5" w/o Controller Cards) | Q24-DN000000009192 | NEC | 1 | 3,319 | 2 | | 6,638 |
| M300 Controller Card Kit (2x 8Gb FC 4Port Card) | NF5331-SF02WE | NEC | 1 | 8,452 | 2 | 16,904 | |
| 3 Years Upgraded Platinum Warranty for M300 Controller Card 8Gb FC 8Port | Q24-DN000000009197 | NEC | 1 | 2,282 | 2 | | 4,564 |
| M300 Extended Cache Memory (From 8GB to 16GB) | NF5331-SC01E | NEC | 1 | 1,195 | 2 | 2,390 | |
| 3 Years Upgraded Platinum Warranty for M300 Cache Memory Extension 8GB->16GB | Q24-DN000000009212 | NEC | 1 | 325 | 2 | | 650 |
| MSeries SAS Disk Drive(2.5", 10krpm/450GB, 6Gbps) (+10% spares) | NF5321-SM767E | NEC | 1 | 445 | 47 | 20,915 | |
| 3 Years Upgrade Platinum Warranty for M-Series SAS Disk Drive(2.5" 10Krpm/450GB, 6Gbps) | Q24-DN000000006757 | NEC | 1 | 300 | 2 | | 600 |
| CRU FC CABLE 5M x2 (MHLCLC-5MQ) 5M (+2 spares) | Q24-RH000000063466 | NEC | 1 | 54 | 4 | 216 | |
| 3 Years Upgrade Platinum Software Maintenance for M300 StorageBaseProduct | Q24-DN000000010477 | NEC | 1 | 3,146 | 2 | | 6,292 |
| Dot Hill Systems Storage | | | | | | | |
| 4120 2JM NO DRIVES AC V2 DH | D4120C000000BA | DotHill | 4 | 3,500 | 11 | 38,500 | |
| 12G SAS 200GB SSD eMLC (+10% spares) | PFRUKRXSXN145-01 | DotHill | 4 | 1,800 | 182 | 327,600 | |
| AMS SFF BLANK BB FRU PKG | PFRUKF31-01 | DotHill | 4 | 18 | 99 | 1,782 | |
| 1YR UPG ONSITE 7X24X4 SFF JBOD 1YR AME | DS-7X24X-SJ-1Y-A-U | DotHill | 4 | 1,771 | 33 | | 58,443 |
| UPS 3kVA | 050-02424-000 | NEC | 1 | 1,799 | 2 | 3,598 | |
| 19" Rack frame, 42U rack - Black | 050-02378-001 | NEC | 1 | 1,799 | 1 | 1,799 | |
| | | | | | | Subtotal | 438,290 |
| | | | | | | | 77,187 |
| Server Software | | | | | | | |
| Microsoft SQL Server 2014 Enterprise Edition 2 core License | TBD* | Microsoft | 2* | 13,473 | 30 | 404,175 | 259 |
| | | | | | | Subtotal | 404,175 |
| | | | | | | | 259 |

continued on the next page



NEC Express5800/A2040b

TPC-E 1.12.0 TPC Pricing 1.7.0

Report Date
18-Feb-2014

Available Date
15-Apr-2014

Client Hardware

Express5800/R120d-2M

| | | | | | | | | |
|---|--------------------|------------|---|-------|----|-----------------|---------------|--------------|
| Express5800/R120d-2M, No CPU, no RAM, no ODD, no HDD, no PSU, no bezel | N8100-1793F | NEC | 1 | 1,920 | 2 | 3,840 | | |
| Xeon E5-2690 Processor Kit, E5-2690, 2.90GHz, 8C/16T, 135W | N8101-552F | NEC | 1 | 3,510 | 4 | 14,040 | | |
| Processor Heat Sink For 2nd CPU for R120d-2M | N8101-553F | NEC | 1 | 125 | 2 | 250 | | |
| 32GB DDR3-1600 REG Memory Kit, 2x 16GB, DDR3L-1600, Registered | N8102-471F | NEC | 1 | 500 | 16 | 8,000 | | |
| RAID Controller (512MB, RAID 0/1) | N8103-149 | NEC | 1 | 350 | 2 | 700 | | |
| 146.5GB HDD, SAS2.0(6Gbps), 15,000rpm, 2.5-inch, HotPlug, new tray | N8150-303 | NEC | 1 | 270 | 4 | 1,080 | | |
| 10GBASE Adapter (SFP+/2ch), PCIe (x8), FH/LP, SR | N8104-128 | NEC | 1 | 550 | 2 | 1,100 | | |
| SFP+ Module (10G-SR) | N8104-129 | NEC | 1 | 110 | 4 | 440 | | |
| 800W Hot Plug Power Supply, 80 PLUS Platinum | N8181-87F | NEC | 1 | 265 | 2 | 530 | | |
| 6 ft Universal Power cord - IEC320 C13 to NEMA 5-15P | 307-00012-000 | NEC | 1 | 4 | 2 | 8 | | |
| 3 Year upgrades to Platinum Warranty for R120d-2M GP Server | Q24-DN000000012023 | NEC | 1 | 1,799 | 2 | | 3,598 | |
| 14ft Cat5e / Cat5 350MHz Snagless Patch Cable RJ45 M/M Blue 14' (+2 spares) | N001-014-BL | Tripp Lite | 3 | 6 | 8 | 48 | | |
| 10ft Cat5E 350 MHz Snagless Patch Cable - Red (+2 spares) | 15203 | C2G | 3 | 5 | 4 | 20 | | |
| | | | | | | Subtotal | 30,056 | 3,598 |

Client Software

| | | | | | | | | |
|---|-----------|-----------|---|-----|---|-----------------|--------------|----------|
| Windows Server 2012 Standard ¹ | P73-05761 | Microsoft | 2 | 735 | 3 | 2,205 | (Included) | |
| | | | | | | Subtotal | 2,205 | 0 |

Infrastructure

| | | | | | | | | |
|---|----------|------------|---|----|---|-----------------|------------|----------|
| 3M 10Gb MMF Fiber 50/125 OM3 LSZH Patch Cable LC/LC Aqua 10ft (+2 spares) | N820-03M | Tripp Lite | 3 | 26 | 6 | 156 | | |
| SE2500 - switch - 5 ports - unmanaged - desktop (+2 spares) | SE2500 | Linksys | 3 | 54 | 4 | 216 | | |
| | | | | | | Subtotal | 372 | 0 |

TOTAL 1,109,798 90,093

NEC Large Volume Discount²

-10% -33,469 -1,265

Notes:

Pricing: 1-NEC Contact: 1-866-632-3226, 2-Microsoft, 3-CDW, 4-Promark TECHNOLOGY

* These components are not immediately Orderable. See the FDR for more information.

1, Qty of Windows Server 2012 Standard Edition includes the license of the DB server's system maintenance Console.

2, 10% discount was based on the overall value of the specific components from NEC in this single quotation except for 3-yr Mnt. Price for Disk Subsystem.

Discount for similarly sized configurations will be similar to those quoted here but may be vary based on the components in quotation.

Results and methodology audited by Francois Raab of InfoSizing, Inc. (www.sizing.com)

Prices used in TPC benchmarks reflect the actual prices a customer would pay for a one-time purchase of the stated components. Individually negotiated

discounts are not permitted. Special prices based on assumptions about past or future purchases are not permitted. All discounts reflects standard

pricing policies for the listed components. For complete details, see the pricing sections of the TPC benchmark specifications. If you find that the stated

prices are not available according to these terms, please inform the TPC at pricing@tpc.org. Thank you.

3-Yr. Cost of Ownership: **\$1,165,158**

tpsE Throughput: **5087.17**

\$ / tpsE \$229.04



NEC Express5800/A2040b

TPC-E 1.12.0
TPC Pricing 1.7.0

Report Date
18-Feb-2014

Available Date
15-Apr-2014

Numerical Quantities Summary

Reported Throughput : 5,087.17 tpsE **Configured Customers :** 2,750,000

| Response Times (in seconds) | Minimum | Average | 90 th %tile | Maximum |
|-----------------------------|---------|---------|------------------------|---------|
| Broker Volume | 0.00 | 0.04 | 0.07 | 0.55 |
| Customer Position | 0.00 | 0.03 | 0.06 | 0.88 |
| Market Feed | 0.00 | 0.02 | 0.04 | 4.79 |
| Market Watch | 0.00 | 0.02 | 0.04 | 0.99 |
| Security Detail | 0.00 | 0.01 | 0.03 | 0.92 |
| Trade Lookup | 0.00 | 0.07 | 0.11 | 0.61 |
| Trade Order | 0.00 | 0.06 | 0.11 | 0.83 |
| Trade Result | 0.00 | 0.06 | 0.13 | 4.84 |
| Trade Status | 0.00 | 0.02 | 0.03 | 0.98 |
| Trade Update | 0.01 | 0.08 | 0.12 | 0.66 |
| Data Maintenance | 0.00 | 0.01 | | 0.14 |

| Transaction Mix | Transaction Count | Mix % |
|-------------------|-------------------|---------|
| Broker Volume | 17,949,416 | 4.900% |
| Customer Position | 47,621,088 | 13.000% |
| Market Feed | 3,662,807 | 1.000% |
| Market Watch | 65,935,916 | 18.000% |
| Security Detail | 51,284,358 | 14.000% |
| Trade Lookup | 29,304,844 | 8.000% |
| Trade Order | 36,997,903 | 10.100% |
| Trade Result | 36,627,658 | 9.999% |
| Trade Status | 69,599,809 | 19.000% |
| Trade Update | 7,326,398 | 2.000% |
| Data Maintenance | 120 | |

Test Duration and Timings

| | |
|--|-------------|
| Ramp-up Time | 0:57:13 |
| Measurement Interval | 2:00:00 |
| Business Recovery Time | 1:21:09 |
| Total Number of Transactions Completed in Measurement Interval | 366,310,197 |